Memorandum

To: Ben Cope (EPA)

From: Merlynn Bender (Reclamation, TSC, 86-68220)

Date: March 14, 2008

Subject: Columbia River Temperature TMDL – Draft 3/4/08 Meeting Summary
Comments

The meeting summary should include concerns that were raised as well as points of agreement. The summary appears to capture the points of agreement. The following outlines some of the primary concerns raised by Reclamation that do not appear in the summary.

1) (Model-use creep): The one-dimensional (1D) RBM10 model was developed for answering "different" questions before the temperature TMDL was on the table and is not suited to "solely" answer the types of questions being proposed now for the temperature TMDL. If two-dimensional sensitivity analysis tools are available, those tools should be used to feed information into the decision-making process.

2) (Violation of the 1D complete-mixed assumption): In thermally stratified impoundments, the RBM10 model violates the one-dimensional complete-mixed assumption. This has the tendency to overweight warming to the large upstream cool stratified impoundments with release temperatures much cooler than equilibrium temperatures. The overweighting effect can be interpreted from Table 4-2 of the Columbia/Snake Rivers Temperature TMDL Preliminary Draft July, 2003 by comparing to reservoir volume (size and stratification potential) and distance of the dams from the mouth of the rivers.

3) (Failure to factor in water residence-time lag): In stratified impoundments, the lag associated with storing cool water must be incorporated into a temperature TMDL analysis. For example, Canadian water flowing into Lake Roosevelt during summer is warmer than water released from Grand Coulee Dam (Figure 3.3 of three strategies report), and the roughly 20 to 44 day water residence-time lag (table 3-2 of Reclamation's three strategies June 12, 2003 report) must also be incorporated into a temperature TMDL analysis. The ability of the stratified Lake Roosevelt to store cold water for autumn release and to more quickly pull an interflow of cool Canadian late autumn inflow through the bottom layers should be incorporated into a temperature TMDL analysis.

4) (Credit for historical release of cool water): Historically Grand Coulee Dam has partially been operated to store cool water and pull a cool Canadian water interflow. The third powerhouse and therefore upper outlets have historically been partially used during summer thereby storing cold water for autumn release. The left and right powerhouse and therefore lower outlets have historically been partially pulling a cool Canadian interflow during autumn. The TMDL

incorrectly stresses the "maximum" effect (Table 4.2 of the draft July, 2003 Temperature TMDL) of 6.23 degrees C for Grand Coulee without incorporating the stratification, storing of cold water, lag effect of cool releases in stratified impoundments, and so forth.

5) (Improved Lake Roosevelt geometry needed for hourly operational changes): Due to the huge economic impacts of potential release operational changes at the large peaking power facility at Grand Coulee and effects on the electric power grid, a defensible calibrated hourly two-dimensional Lake Roosevelt temperature model that incorporates recently collected hourly generation data would be required to justify changing existing operations. Geometry is critical to developing a defensible model.

6) (Predation, predation, predation): Predation is the most critical aspect affecting salmon survival and overshadows temperature and habitat concerns. All temperature modeling and potential changes must be kept in line with efforts to reduce predation. Spending billions on temperature reduction while neglecting over fishing or damaging existing salmon redds will negate any potential beneficial effects of reduction in temperature.

7) (Up-to-date data for modeling): A decision to not integrate updated data (2000-2008) into the modeling period must also consider whether the additional data provides a better representation of the thermal and hydrologic variability that is expected to occur.